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ABSTRACT

The introduction to this paper considers competency-based education, the goals of education, and the need for some social indicators of how well students are meeting these goals. The main body of the paper looks at competency differences, instructional approaches, and educational research in several areas: focus of new research; natural variations; differences by school type, subject matter, and instructional approach; aptitude-treatment interactions; self-selection; and compensatory education. The author concludes that research support should be granted for a series of interrelated studies on how to increase a particular competency, rather than for single experiments which have little cumulative educational value. (MF)

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PEDAGOGY AND COMPETENCY-BASED EDUCATION

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

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INTRODUCTION

Whenever educators adopt new goals for student learning or resurrect old ones, attention turns to the curriculum and environment of the educational institution and the question is asked "What do we do, as educators, to ensure that these goals are attained?" With competency-based education, goals are given operational definitions; that is, it is decided what kinds of student behaviors (individual or group) will be counted as evidence that particular goals or learning objectives have been attained. It may be the case that individual students will be assessed in controlled environments to determine whether they have met particular objectives. For some goals, however, this is neither feasible nor desirable.

Consider, for example, goals such as "love of learning," "integrity," "civility," "benevolence," "a sense of responsibility," "appreciation of beauty," "pacifism," "warmth," "ego strength," "a sense of humor," etc. These individual characteristics might well be goals of students for themselves and of educators for them, but most--probably all--do not lend themselves to "spot" evaluation in controlled environments. That is, we have to look at how we or someone else behaves over a very long period of time and take circumstances into account to make any sensible judgment about where anyone might stand with respect to these characteristics. Furthermore, decisions on whether or not such judgments are to be shared with the person judged, or in the case of self-judgment--admitted, count among some of the most serious decisions people make. "Who can we trust with our self-evaluations?" and "Who has the authority and ability to evaluate people on these dimensions?" are very "touchy" questions indeed.

Yet, in recognition that such characteristics as these are negatively or positively affected by the curriculum and environment of educational institutions and that there is no way of avoiding this, there is an interest in developing some sort of social indicators of how well the student body as a

group is doing with respect to certain educational goals.

This division of kinds of goals and how progress toward them will be evaluated has its parallel in pedagogy. Some goals will be objectives of instruction (like, for example, teaching students to write papers and make speeches); others will be left to other dimensions of the institutional environment.*

In considering the environment of the institution, such factors as adult models, the system of rewards and punishments, the formal and informal structures of interaction, etc., all need to be taken into account. The variables are enormously complex. It is little wonder that so many of them tend to be ignored. Moreover, it is very difficult to achieve consensus about dispositions and character traits to be promoted. It is most easy in small denominational colleges. It is almost impossible at large secular universities. Therefore, at universities a lion's share of the curriculum is "hidden." The development of dispositions and character traits is being influenced, but usually not intentionally or at least not explicitly.

It is not difficult to understand, then, that since CBE practitioners are intensively reexamining educational goals and attempting to design appropriate curricula and institutional environments for attaining these goals, the dilemma of what characteristics to promote and several other issues are floating to the surface.

In CBE, more issues are being publicly and consciously resolved one way or another than in traditional programs. Apart from the political problems this creates for these programs, there are problems stemming from lack of information needed to design appropriate, effective learning experiences.

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* Of course, a student's total environment must be taken into account with respect to educational goals, but for purposes of educational planning, educators must focus primary attention on the environment they can create for student learning and the instruction they can provide.

Given any dimension of development an institution might wish to promote, a series of questions is generated. Take, for example, "problem solving":

1) Is there such a thing as a general problem solving capability or are the abilities and dispositions required for solving problems in one domain different from problem solving in other areas (for example, in philosophy, untangling a confused passage; or, in engineering, debugging an oscilloscope; in art and poetry, capturing a mood). Is there any overlap?

2) How do problem-solving abilities in one area interrelate with problem-solving abilities in another (e.g., enhance, impede, not affect)? How does this ability interrelate to others we wish to promote?

3) What subject matter is most effective in promoting a particular kind of problem solving (assuming there are different kinds which seems apparent)?

4) What pedagogical techniques are most appropriate? (Lectures, reading assignments, computer-assisted learning, intensive seminars, discovery learning, individual or group projects, etc., or some combination of these?)

5) What mode of faculty organization is called for to promote problem-solving abilities? (For example, interdisciplinary project teams, departments or divisions with faculty in one discipline--i.e., traditional mode of organization; tutors or mentors located in the community with loose institutional ties; etc.)

6) What environmental factors beyond the institution influence the development of problem-solving abilities?

7) What characteristics must the faculty have to promote this ability in students?

8) Do adults acquire this ability in ways that differ from young children?

9) How can adults be motivated to wish to acquire and persevere in acquiring this ability?

Multiply this by the number of competency objectives of CBE institutions and you will have a good idea of the enormity of the undertaking CBE represents and, perhaps, an appreciation of why some things that CBE practitioners would change have not yet changed in practice. The amount of work to be done to

approach the ideal of a highly rationalized curriculum and environment also points out the importance of building into CBE programs a kind of flexibility that allows for changes in the future as better answers are found to the questions being asked.

In general, CBE practitioners are hard-pressed to locate people that can deal with these questions, and what little information is available is scattered and of dubious quality. One very helpful, probably very costly and, maybe, impossible (in terms of available talent) contribution to CBE (and, of course, to traditional programs) would be a bibliography of materials relating to these questions and some sort of evaluation of these materials. It would be important that such a bibliography not ignore "old" materials. Currently, with regard to these questions, CBE is dependent upon the ERIC system which, although very helpful, possibly overlooks more of relevance in this area than it includes.

Beyond making the findings of past investigations of these questions available in some manageable form to educators, there are particular kinds of new research which would shed light on some of these questions. Regarding setting priorities for research relating to particular kinds of competencies, decisions would have to be made as to where the need is greatest in terms of:

(a) volume (number of institutions interested in promoting that ability);

(b) broad social needs (e.g., the ability to understand and communicate with people who speak different dialects of English and Spanish--important in human services areas such as education, medicine and counselling; or the ability to interpret nonverbal behavior--important in the same areas);

(c) importance in terms of developing other abilities (e.g., the ability to read and comprehend college texts, the ability to deal with abstractions, and the ability to express oneself well in speaking and writing undergird development of many other abilities of central importance in education).

Tradeoffs would have to be made.

In the remaining sections of the paper, David McClelland outlines some approaches to research which show promise in terms of locating and analyzing "competencies" and discovering means for promoting their attainment.

Sheila Huff

FOCUS OF NEW RESEARCH

Pedagogy is always shaped by its goals. For example, the approach used when instructing someone to play tennis will differ from the approach used in teaching someone to remember facts and faces. Most of the research on educational practices has had a goal of determining how people can more quickly acquire specific bits of knowledge. Thus, the research has tended to focus on whether it is better to present the material all at once or in bits, whether one should give rewards in small portions, or whether the learner should be encouraged to discover the bits rather than respond as they are fed to him.

The "new" types of competencies of interest to educators tend to be of a more general nature. They are not restricted to such cognitive abilities as memory for content in specific areas, but comprise qualities like empathy, motivation for achievement, a proactive thinking style, etc. It is essential, therefore, that investigation not be restricted to old categories which describe various pedagogical techniques for acquiring content. The research net must be cast more widely to include approaches not previously used. Specifically, emphasis needs to be placed upon helping students acquire generalized competencies that will enable them to flexibly and effectively deal with life's problems and possibilities.

In attempting to outline fruitful approaches to such research, it is helpful to formulate a concrete example of a type of competency educators wish to promote. This will provide a focus and prevent our becoming lost in abstractions.

Stewart's (1975)* measure of "self-definition" is a good example of what we want to learn about competencies. This measure is obtained by scoring

* Full references are given at end of paper.

written imaginative stories for such variables as thinking in terms of cause and effect. People who write and think in terms of "if...then" clauses and also give reasons for action score high on this variable; those who simply describe actions score low. The scoring has proven highly reliable, and it has been demonstrated that the variable is significantly related to career continuance for women and to voluntary participation in community enterprises for men.

We also know that higher education affects the degree of "self-definition." Questions that may be posed are: What are the various ways in which self-definition can be increased through education? How can we discover what increases and decreases it? We need not restrict ourselves to this example, but such questions are prototypical of what we want to know about similar types of generalized competencies.

NATURAL VARIATIONS

One fruitful mode of investigation is to learn which groups of people have a given ability or characteristic in high and low degrees and attempt to find out how the characteristic is produced "naturally" (that is, more or less unintentionally) in society.* In similar fashion, if we wanted to learn what conditions produced a lush growth of grass, it would be useful to locate good and poor growths and then analyze soil and climate conditions affecting growth.

Studies in this area would include individual differences in self-definition caused by various background variables such as social class, ethnicity, sex, and parental socialization techniques. Very possibly, people brought up in certain ways tend to be more self-defining. If so, this would provide important cues for designing learning situations to increase self-definition.

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* Sometimes it is necessary to look to other cultures in order to study an ability in its most highly developed manifestations; for example, the ability to focus one's attention. This ability is highly developed among Asian yogas.

DIFFERENCES BY SCHOOL TYPE

Next, it is important to study the impact of intentional educational environments. What types of colleges or secondary schools increase competencies such as self-definition?* There are many "natural experiments" to examine. One would be schools which claim to increase self-defining characteristics by requiring student participation in goal setting and other areas.

Do they, in fact, increase self-definition? Are there important differences in competency outcomes from exposure significantly different educational environments? Early research in this area was discouraging because even radical departures from educational practice seemed to have little impact on acquisition of content--the only competency then measured. Recent work, however, shows that a college environment similar to Harvard's has a major impact on several student competencies. Similar competency achievement is not present in the same degree in graduates of, for example, a state college. The theoretical question then becomes: Why is Harvard or any similar college more successful in increasing self-definition than a state school?

DIFFERENCES BY SUBJECT MATTER

It may be that certain types of subject matter increase particular skills. This line of thought is similar to an older one that the study of Latin improved thinking ability. More recent findings demonstrate that art courses (in the humanities) improve one's talent in forming new concepts, whereas science courses enhance one's skill in picking up new factual information. Perhaps social studies or psychology increase self-definition by giving the person a better sense of himself. Philosophy and law courses may increase analytic abilities, while self-analytic material may enhance one's empathic propensities. Further research which addresses the relationship of various instructional

* These studies are sometimes called "value-added" studies.

contents to competency outcomes would be of considerable interest to educators.

DIFFERENCES BY INSTRUCTIONAL APPROACH

Traditional educational research generally centers on the classroom with a greatl deal of attention given to the learning of specific content, under particular conditions, in interaction with a teacher using a particular pedagogical technique. As the wasteland of unremembered findings in the journals suggests, this approach is not very fruitful unless guided by theory or findings obtained from the more global approaches listed above.

One reason for starting with naturally occurring differences in competencies is to take into account the fact that global or major climate inputs may be necessary to affect certain competency outputs. Classroom variations always occur in a larger context, even if they do not show up in the researcher's experimental design. We can vary treatments almost endlessly, find that they have effects which are statistically significant, and still not add to the existing knowledge of how to increase a competency in the real world. Proposals for experimental treatment studies must always be evaluated in terms of how the results fit into the larger educational context and how they might be utilized beyond experimental settings.

The major problem in educational research is not that we are ignorant of how learning takes place. We have known for a long time that humans are constructed so that they learn fastest (1) when they make a response, (2) when they know they have made the response (and get precise feedback), and (3) when they want to learn the response (or respond to the reward involved in learning it). The problem is technological, not theoretical.* We do not know how to get pupils to make responses (or how to measure their responses in a

* And, of course, political and ethical; that is, "who decides what is to be learned"; and "what are acceptable means for inducing learning."

way that will tell them they have made it), or how to motivate them to learn.

Much of the early success of programmed learning was the result of researchers who, in a very simple-minded way, applied our knowledge of how learning works. They elicited bite-sized responses, let people know when they had provided the appropriate response, then attempted to reinforce that behavior. This approach ultimately proved to be of very limited utility, not because their theory was wrong, but because the technology was inapplicable to more generalized competencies and to more complex social and motivational environments.

How does one get a person to make a self-defining response? How can they know they have made it? Answers to such questions require investigating a host of variables relating to instructional techniques. The value of the investigation depends to a very large extent on a researcher's understanding that what is being manipulated can be significant only if it influences one of the three variables known to affect learning; that is, only if these techniques help students make responses, let them know they have made it, and provide a motivational context for learning. All variations in educational input must be evaluated in terms of their likely impact on the fundamental variables which control learning.

It is within this framework that one should evaluate attempts to improve instructional approaches through: (a) classroom management techniques, (b) instructional aids such as the media, and (c) different organizational arrangements. Kounin (1971), for example, has found that the more successful teachers use "alerting" techniques (help pupils make responses) or are "with it"--that is, they know who has made a response and correctly acknowledge it. More classic variations in classroom management, such as using reward or punishment, being authoritarian or warm, or dividing the work up into small or large units, should be investigated again only within the context of how they affect the fundamentals of learning. The same must be said for media techniques. If one wants to study the impact of closed-circuit TV on self-definition, it is essential to determine how it will help the people make

responses, realize they have made them, etc. If one wants to know if short intensive courses are more effective for building certain competencies—as they seem to be for increasing the achievement motive (McClelland and Winter, 1969)--one should think of the design in terms of its impact on motivation for learning, on getting participation, or giving feedback.

One must also, of course, concentrate on delivering what is discovered. Educational researchers must be oriented not only towards learning and motivation theory, but towards delivery systems. For example, it has been conclusively demonstrated that "saturation" group therapy is more effective in promoting "mental health" than seeing groups once or twice a week. We have not been able to take advantage of this knowledge for two reasons: first, no one has found a way to convince mental health professionals to give up their weekends for such sessions; second, attempts to convince business to allow workers to take days off to attend the groups have been unsuccessful. Similarly, we know that intensive courses develop achievement motivation. Unfortunately, it has been very difficult to find ways of introducing such courses into traditional educational environments.

APTITUDE-TREATMENT INTERACTIONS

In education, as in everything else, it is important to take individual differences into account. With aptitudes, for example, people with aptitude A are helped most by Treatment X; whereas those with Aptitude B are helped most by Treatment Y. Men may learn assertiveness better through modeling, women through confrontation, children through memorization, etc. Students high in affiliation motivation learn more from a warm teacher, while those high in achievement motivation learn best from a classroom in which much feedback is given.

One of the most controversial educational issues of the day is whether students should be graded or not. Clearly, learning theory has concluded that a person needs feedback to learn: he must know if he has made the response

or the degree to which he has approximated it, however generalized it may be. Grades perform that function only very roughly. They may not tell a student exactly what he has done wrong or right.

But grades do give a good student recognition and open the way for him to certain opportunities and privileges. This credentialing aspect of grades turns out to be quite important for people with a high need for power or recognition. They work for better grades, and a dropping average may be "de-motivating" for them. The research problem is to learn what effect this kind of motive-reward system has on learning things such as self-definition and then to compare its success with other types of systems. For example, does giving feedback--without grades--on performance work to increase competency for those students high in achievement needs? How does this feedback affect those who have high power needs? In other words, does a pedagogical technique like grading have a different effect depending on the dominating motive of students? And how can teachers function most effectively if they have many different kinds of students in their classes?

Such questions expand into other research issues. Some of these questions may be: Which type of student does better later on in society--the student who has acquired an ability in response to a prestige reward like a grade or the student who has learned it because of its challenge? Does the means of acquiring an ability have no effect on its exercise in later life?

SELF-SELECTION

An important research problem arises from the fact that students with certain aptitudes, characteristics and interests generally select the kind of postsecondary education they will pursue--science students tending to take mostly science courses; art students tending to take mostly humanities courses. Under these circumstances educators would like to know how science students can come to appreciate the humanities and to develop competencies best acquired through that subject matter and vice versa for art students? This

question will become more pressing when and if researchers begin to demonstrate the significance of particular subject matters for the acquisition of particular kinds of competence. Such discoveries might provide an empirically sound foundation for constructing core curricula for general education.

COMPENSATORY EDUCATION

As previously discussed, individual differences must be taken into account in developing effective pedagogical techniques. Many relevant individual differences may be accounted for by environmental factors such as whether a student was brought up in a rural, suburban or urban environment; whether a student's family was relatively affluent or not; whether or not a student was required to carry responsibilities in the family; whether or not a student was required to make decisions for himself; etc.

The aim is, of course, to develop highly effective and efficient special instructional techniques that will enable students from one kind of environment that does not promote the acquisition of a particular kind of competence to achieve a level of proficiency commensurate with that attained by students from environments that do promote its acquisition.

Consider, for example, de Charms' (1975) project which focuses on developing achievement-related or "origin" orientations among ghetto children in St. Louis. This research could be a model for the kinds of research supported in this area. Learning theory was considered in the sense that it was designed to increase the ability of students to make origin-type responses in the classroom in specific measurable ways, so that they could know when they were improving. It took motivation theory into account when designing the educational inputs and enlisting participation of pupils and teachers. Also considered was the importance of the delivery system involving superintendents, principals, and teachers in the project. It failed only at the highest system level because it did not provide a way for the input to continue after it had been demonstrated to be successful. A continuation of input should be the goal of subsequent re-investigation.

CONCLUSION

In summary, research on ways of acquiring competencies should be supported which focuses on the following areas:

1. Natural variations in competencies;

2. Educational environments (or institutions) that produce wide variations in competencies;

3. Subject matters that are especially appropriate for producing various competencies;

4. Experimental studies of educational treatments that produce various competencies provided they focus on the elements that produce learning and take into account the requirements of social delivery systems;

   Among the treatment variables of particular interest are: classroom management techniques, the media, and various types of organizational arrangements for delivery.

5. The relationship of educational "treatments" to characteristics that the person possesses at the outset. Of particular importance is the investigation of what educational treatments work best for those who start very low on the competency in question.

Research support should be for a series of interrelated studies of how to increase a particular competency. Single-shot experiments have little cumulative pay off in the educational field.

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